KORNILOV, S.A.

Reflex klystrons as regenerative microwave amplifiers. Trudy LIP
no.194:14-25 '58.   (MIRA 11:11)
          (Klystrons)

AUTHOR: Kornilov, S.A.

TITLE: Some results of an experimental study of metal-glass multiplier
            klystrons

TEXT: Results of a study and experimental investigation on multiplier
klystrons with a multiplication coefficient 10, an output power $\sim$50 mW and an
efficiency of the order of tenths of a per cent (frequency of the tenth harmonic
$\approx$ 3,000 Mc) are reported. Designs comprising input gaps with and without grids
are discussed; some considerations are set forth in favor of the latter, which
have better parameters.

[Abstracter's note: Complete translation]   D. Petrov

Card 1/1

AUTHORS: S.A. Kornilov and O.N. Kazbekova   SOV/109- - -4-3-18/38

TITLE: Detection in the Cathode Circuit of an Under-Excited
           Reflex Klystron (Detektirovaniye v katodnoy tsepi
           nedovozbuzhdennogo otrazhatel'nogo klistrona)

ABSTRACT: It was suggested by the author, Kornilov, in 1955 (Ref 6)
           that the envelope of a high-frequency signal which is
           amplified by a klystron can be detected directly in the
           cathode circuit of the klystron tube.   The circuit for
           this purpose is very simple, as can be seen from Fig 1.
           The detected signal is taken from a resistance R which
           is connected into the cathode circuit of the tube;   the
           klystron performs the function of a regenerative
           amplifier as well as the detector. The problem of
           employing this type of detection was investigated experi-
           mentally at frequencies of 3000 Mc/s and 10000 Mc/s.
           The circuits employed for the measurements are shown
           diagrammatically in Figs 2 and 3.   From the experiments
Card 1/3   it was found that at low input signals a square detection
           characteristic was obtained.   At large input signals a

Detection in the Cathode Circuit of an Under-Excited Reflex Klystron   SOV/109- - -4-3-18/38

saturation effect was observed. The amplification
coefficient of the system as a function of the cathode
resistance R was measured and the results are plotted
in Fig 4 for two values of the reflector voltage.   The
sensitivity of the detectors is illustrated in Fig 5;
the axis of the abscissae represents the potential of the
reflector, while the axis of the ordinates shows the
sensitivity in the maxima of the "amplification regions".
It was found that the threshold sensitivity of the
klystron operating at the wavelength of 3 cm was 10-11 W.
On the other hand the threshold sensitivity for the
10 cm klystron was 10-10 W.   The mechanism of the
detection in the cathode circuit can be analysed
theoretically.   If it is assumed that the emission
current is constant and that the thermal velocities of
the electrons emitted by the cathode are governed by the
Maxwell distribution law, the detector characteristic
can be expressed by:

Card 2/3
$$\Delta i = \frac{1}{2}\left(\frac{q}{kT}\right)^2 \beta^2 U^2$$

Detection in the Cathode Circuit of an Under-Excited Reflex Klystron

SOV/109- - -4-3-18/38

This formula is in good agreement with the experimental results. On the basis of the above investigation it is concluded that the use of the cathode-type detection in a klystron is quite feasible, especially in view of the fact that the threshold sensitivity is of the same order as that of a crystal detector. The input impedance of a video amplifier which is connected to the cathode circuit can be comparatively low (of the order of several thousand ohms).

Card 3/3 There are 6 figures, 1 table and 6 references, 5 of which are Soviet and 1 English.

SUBMITTED: September 7, 1957

9.4228

66711

SOV/109-4-8-32/35

AUTHORS: Kornilov, S.A. and Pomyatikhin, V.A.

TITLE: The Characteristics of a Frequency Multiplier Based on
             a Reflex Klystron

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8,
             pp 1402 - 1404 (USSR)

ABSTRACT: The multiplier is illustrated in Figure 1. The bunching
             of the electrons in this system is done by the modulation
             of the reflector voltage. For this purpose, a coaxial
             resonator, tuned to the frequency which is to be multi-
             plied, is connected to the gap between the upper grid of
             the klystron and the reflector. The harmonic of the
             electron current thus produced is "extracted" by a
             resonator connected between the grids of the klystron.
             This method of modulation of the electron beam permits
             complete separation between the input and output circuits,
             while employing a standard-type reflex klystron. The
             experiments were carried out on klystrons with external
             and internal resonators; the klystrons with external
             resonators operated in the frequency bandwidth of

Card1/3

66711

SOV/109-4-8-32/35

The Characteristics of a Frequency Multiplier Based on a Reflex
Klystron

3 000 Mc/s, while those with an internal resonator
operated in the vicinity of 10 000 Mc/s. The results
of the measurements for the 3 000-Mc klystrons are
shown in Figures 2 and 3. Figures 2 show
the output power as a function of the reflector
potential for a constant power of the input signal
$(P_1 = 6.4 \text{ W})$, and the dependence of the output power

on the beam current; the klystron operated as a
frequency quadrupler. Figure 3 shows
the output power as a function of the multiplication
factor n at the optimum reflector potential. Investi-
gation of the frequency multiplication by means of a
klystron with an internal resonator showed that at input
powers of the order of 1.1 W , it was possible to obtain
an output power of 0.4 mW, while the system worked as
a frequency quintupler. Photographs of the two types of
the multiplier klystrons are shown in Figure 4.

Card 2/3

66711
SOV/109-4-8-32/35

The Characteristics of a Frequency Multiplier Based on a Reflex
Klystron

There are 4 figures and 1 Soviet reference.

SUBMITTED: September 5, 1958

Card 3/3

9.4220

77788
SOV/109-5-2-21/26

AUTHORS: Kornilov, S. A., Yemel'yanov, A. F.

TITLE: Experimental Investigation of a Klystron Frequency
               Divider With Preliminary Bunching (Brief Communication)

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 2,
               pp 336-338 (USSR)

ABSTRACT: Reference is made to previous work by the first-named
               author (this Journal, 1958, 3, 4, 522) regarding an
               ordinary klystron with biharmonic resonator and a
               triple-grid reflex klystron. A two-fold frequency
               division was described in the above articles. The
               subject of the present work is a study of klystron
               efficiency for frequency division by factors higher
               than two. A variant of klystron divider characterized
               utilization of preliminary bunching at governing frequency
               with a regenerative reflex oscillator was selected for
Card 1/7   tests. Such a klystron type is shown in Fig. 1.

Experimental Investigation of a Klystron
Frequency Divider With Preliminary Bunching
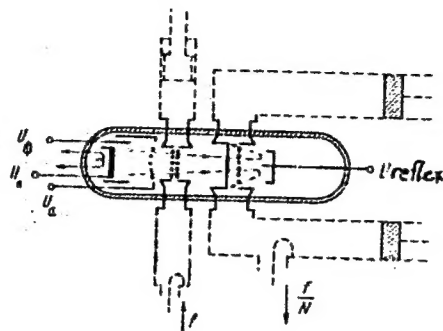(Brief Communication)

77788
SOV/109-5-2-21/26

Fig. 1. Design of dividing klystron.

Card 2/7

Frequency oscillations f, which are to be divided,
enter input resonator and modulate the electron
beam velocity. The bunched beam governs the
regeneration process at the divider output, which

Experimental Investigation of a Klystron
Frequency Divider With Preliminary Bunching
(Brief Communication)

77786
SOV/109-5-2-21/26

works on the principle of a reflex klystron, regenerated at a lower frequency f/N, where N is the frequency divisor. Electron beam current is controlled by the electron gun anode potential U_a. Focusing is assured by selection of an electrostatic potential (U) for the focusing ring. The klystron was designed for frequency division at 3,000 mc. The division was controlled by tuning a broad-band output resonator. The experiment used a saw-tooth voltage modulation. A two-fold division could be achieved both in auto-oscillation (synchronization) and potential (2nd type resonance) circuits. For divisors higher than 2, only synchronization could be achieved. Figure 3 shows the variation of synchronization band Δf and of synchronized oscillation power $P_{f/N}$ for N = 3 on input signal P_f power at different currents in input resonator gap. A common feature of these curves is the presence of a "ceiling".

Card 3/7

Experimental Investigation of a Klystron
Frequency Divider With Preliminary Bunching
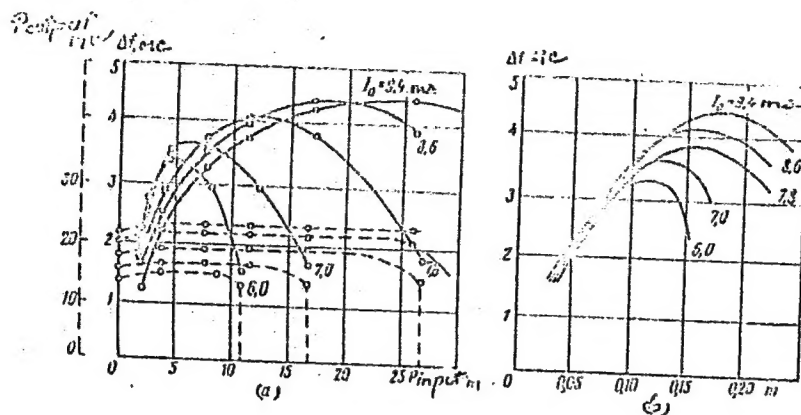(Brief Communication)

77788
SOV/109-5-2-21/26

Fig. 3. (a) Dependence of synchronization band Γ on
input power P_{in} at different currents, I_o, in klystron
output gap; (b) dependence of synchronization band on
modulation coefficient of beam for density m.

Card 4/7

Experimental Investigation of a Klystron
Frequency Divider With Preliminary Bunching   77788
(Lief Communication)   SOV/109-5-2-21/26

Figure 3b shows the same dependences as functions of beam
modulation coefficient:

$$m = X_0 \left[1 - X_0 \frac{(hl)^2}{12} \right] \frac{\sin hl}{hl},$$

where X_0 is bunching parameter, volume charge not
discounted; h, debunching parameter; l, length of drift.
All the above-shown curves were plotted at reflector
potential -20 v (in the center of oscillation zone).
Practically, a complete reflection of electrons was
observed. Figure 4 shows the dependence of synchroniza-
tion band on the divisor at retuning of the output
resonator. Experimental results indicate that
klystron principle can be applied successfully for
frequency division with high divisors. As transmission
coefficient of a k :tron divider is greater than 1,
a cascade connecti... of several dividers is possible.

Card 5/7

Experimental Investigation of a Klystron
Frequency Divider With Preliminary Bunching
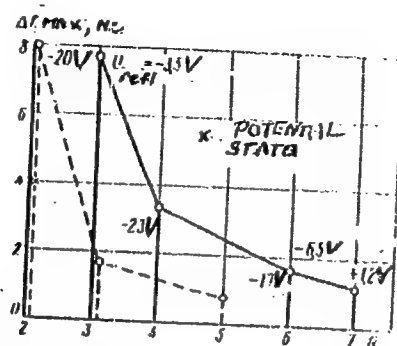(Brief Communication)

/7788
109-5-2-21/26

Fig. 4. Dependence of maximum synchronization band
f_{max} on divisor N.

Card 6/7

Experimental Investigation of a Klystron   77788
Frequency Divider With Preliminary Bunching   SOV/109-5-2-21/26
(Brief Communication)

There are 4 figures; and 4 references, 3 Soviet, 1 U.S.
The U.S. reference is: T. J. Bridges, A Parametric
Electron Beam Amplifier, Proc. I.R.E. 1958, 46, 2,
494.

SUBMITTED: May 26, 1959

Card 7/7

V.4920

AUTHORS: Bergenkov, O.A., Kornilov, S.A., and Lomakin, G.V.

TITLE: A theoretical and experimental study of klystron dividers with pre-bunching

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 6, 1961.
945 – 953

TEXT: The results of experimental analysis of klystron dividers have been presented in Ye.N. Bazarov, and M.Ye. Zhabotiniskiy (Ref. 2: Preobrazovaniye chastoty na otrazhatel'nom klistrone, Radiotekhnika i elektronika, 1959, 4, 2, 253); and (Ref. 3: Delen-iye chastoty na otrazhatel'nom klistrone, Radiotekhnika i elektro-nika 1956, 1, 5, 6, 80). In quantitative assessment of the perfor-mance of the special klystron divider as used in S.A. Kornilov (Ref. 4: Radiotekhnika i elektronika, 1960, 5, 2, 336), certain additional factors have to be taken into account. These factors were: simultaneous modulation action of the density and velocity of the beam on the process of frequency division and the influence

Card 1/6

24466

A theoretical and ...

S/109/61/006/006/007/016
D204/D303

of the non-linearity of potential distribution in the retardation space. In the present article the authors give the results of a numerical analysis of the above factors and of a detailed experimental study of the klystron divider which enables an exact assessment and comparison of both theoretical and experimental data. The analysis is made for a klystron divider dividing by two. Both straight and reflex klystron dividers are analyzed concurrently. The theory of the straight klystron divider with no a.c. velocity component was presented in S.A. Kornilov (Ref. 1: Deleniye chastoty v proletnom klistrone s tremya zazorami, Radiotekhnika i elektronika 1960, 34, 522). The theory of reflex divider with velocity modulation only has been given in Ref. 2 (Op. cit.). In the present analysis it is assumed that there is no regeneration at the first electrode. Assuming small bunching of the beam entering the regeneration region of the klystron, the authors obtain the fundamental component of divided frequency ω in which the Fourier coefficients are determined. In a straight klystron divider, the simultaneous bunching action and velocity modulation of the beam increa-

Card 2/6

A theoretical and ...

ses the division range. The influence of the non-linearity of po-
tential distribution in the bunching region is considered next.
For a reflex klystron the bunching angle $\theta_{02b} = a\theta_{02}$ should be in-

troduced. Since in practice the coefficient of bunching increase
a can be made easily much larger than unity, the non-linear poten-
tial distribution could be used to decrease the required input
power to the klystron divider. This can be done provided that the
electron stream be velocity modulated at the input of the regener-
ation region. The experimental part is then described using a re-
flex klystron frequency divider, the construction of which is
shown in Fig. 2. The picture of equipotential line distribution
(for ± 2 % supply voltage variation) and the electron trajectories
are shown in Fig. 3. Point A corresponds in this picture to the
boundary of the grid of the 3rd diaphragm, B – to that of the
fifth. To determine the value of the amplification of the bunching
coefficient, trajectories 2-I. 2-II and 2-III were constructed and
by graphical integration the transit time of electrons along these
characteristics have been evaluated. The value obtained for "a"

Card 3/6

24466

A theoretical and ...

S/109/61/006/006/007/016
D204/D303

was a = 6.4. The study of static current flow has confirmed the
assumption that in working conditions the beam has a very small
convergence, its diameter varying between 7 mm at the output and
8 mm at the input. To evaluate the accuracy of experimental deter-
mination of parameters of bunching, theoretical and experimental
evaluation of the magnitude of the optimum parameter, for the kly-
stron working as an amplifier, was determined. The discrepancy did
not exceed 15 %. The theoretical and experimental amplitude charac-
teristics of the divider are given graphically; they are in good
agreement. Finally the resonance characteristics of division are
shown, the amplitude of HF voltage and its phase being drawn
against frequency at the input. It is pointed out that the present
article refers only to a divider dividing by two. The characteris-
tic of a klystron performing multiple frequency divisions are gi-
ven in Ref. 4 (Op.cit.). There are 7 figures and 5 references: 4
Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-
language publication reads as follows: D. Hamilton. J. Kuper, J.
Knipp, Klystrons and microwave triodes, N.Y., 1948.

Card 4/6

A theoretical and ...

24466
S/109/61/006/005/007/016
D204/D303

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M.I. Kalinina (Leningrad Polytechnic Institute im. M.I. Kalinin)

SUBMITTED: July 28, 1960

Fig. 2. The arrangement of experimental divider: k, f, a – cathode, focussing ring and anode of electron gun respectively; 1, 2, 3, 4, – diaphragms; o – reflector.
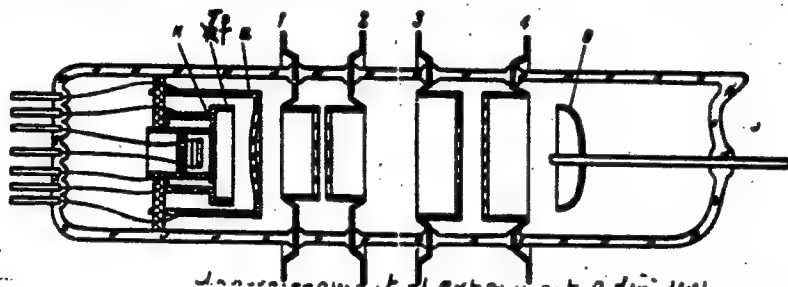
Card 5/6

9,4220

30306
S/109/61/006/011/021/021
D201/D304

AUTHORS: Kornilov, S.A., and Lavrov, V.M.

TITLE: Measuring the power of amplitude fluctuations in a
             reflex klystron

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 11, 1961,
             1941 – 1942

TEXT: The simplest method of measuring the amplitude fluctuations
of SHF generators is by direct detection. Because of the small SHF
powers involved, only semiconductor diodes may be used. Their use
is limited in the low frequency end by noise. In the present short
communication preliminary results are given of measuring amplitude
fluctuations of a reflex klystron within the frequency range of
fluctuations 5 to 200 kc/s. The coherent method of measurement was
used at 3 cm wave-length range. The analyzed SHF oscillations are
channelled in a bridge circuit into 2 channels. After detection the
fluctuations are amplified and applied to a switch which forms at
the output either the sum or difference of channel voltages. If the

Card 1/3

30306

Measuring the power of amplitude ...

S/109/61/006/011/021/021
D201/D304

analyzed generator is not modulated by noise, then the in- and out-
of-phase channels will have the same indicated power (since the
channel noise is incoherent). If the generator is amplitude modula-
ted – a coherent component will appear in both channels which de-
termine the power difference of the two channels. Ferrite switches
are used in the bridge detector arms for good decoupling of chan-
nels. In the experiment the decoupling was not less than 50 db. The
pass-band of the filter was 300 c/s at frequencies between 5 and
20 kc/s and 2 kc/s between 20 and 200 kc/s. The time constant of
the power meter integrating meter was adjustable to give a 1 %
error in noise power measurement. A ferrite SHF modulator was used
for balancing the installation (proper amplitude and phase at the
channel outputs whithin the narrow pass band of the filter). The
results show that in the center of the fluctuation frequency range
the level of noise modulation is lower than that at both ends of
the range. Especially high level noise was observed with detuning
towards the high frequency end. The result obtained at 200 kc/s are
in agreement with those obtained by V.N. Nikonov (Ref. 5: Izv. vu-
zov MVO SSSR (Radiofizika) 1959, 2, 6, 915). The variation in the

Card 2/3

30306

Measuring the power of amplitude ...

S/109/61/006/011/021/021
D201/D304

noise level is thought to be due to errors in calibration. In rea-
lity it is said to have a nearly constant spectrum, as shown by C.
S. Aitchison (Ref. 6: Proc. I.E.E., 1958, B105, suppl. N. 12, 944).
There are 2 figures and 6 references: 2 Soviet-bloc and 4 non-So-
viet-bloc. The references to the 4 most recent English-language
publications read as follows: R. Mueller, IRE. Trans, 1954, ED-1,
4, 42; W. Gottshalk, IRE, Trans., 1954, ED-1, 4, 91; N. Smith,
Proc. I.E.E., 1958, B105, Suppl. N. 11, 800; C.S. Atichison, Proc.
I.E.E., 1958, B105, Suppl. N. 12, 944.

SUBMITTED: May 10, 1961

Card 3/3

9,4220 (1052, 1331)

AUTHOR: Kornilov, S.A.

TITLE: Combinational noise in transient klystron

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 12, 1961
            2017 - 2027

TEXT: The author investigates the effect of current fluctuations
in the projector and voltage fluctuations of the stimulator. Given
that the input of a double-resonator klystron is an oscillation
$U \sin \omega_c t_1 + V(t_1)$, where $V(t_1)$ is a random component of the volta-
ges; the electron current is $I_0 + i(t_1)$ and its speed $v_0 + v(t_1)$,
where $i(t_1)$ and $v(t_1)$ are the fluctuating components. Using the Le-
vellin-Peterson equations as initial conditions, the author obtains
the following expression for the spectrum of the convection current:

$$F_T(\omega) = I_0 e^{-j\omega T} \sum_{(n)} J_n\left(\frac{\omega}{\omega_c} X\right) \int_{-\frac{T}{2}}^{+\frac{T}{2}} \left[1 + \frac{1}{2\pi} \int_{-\infty}^{+\infty} f_T(\omega') e^{j\omega' t_1} d\omega'\right] e^{-j(\omega - n\omega_c) t_1} dt_1, \quad (7)$$

Card 1/4

Combinational noise in transient ...

30434
S/109/61/006/012/009/020
D246/D305

where $X = M_1 U \omega_c T_0 / 2U_0$ - group parameter and $f_T(\omega') =$

$$f_T(\omega') = \int_{-\frac{T}{2}}^{+\frac{T}{2}} \beta(t_1) e^{-j\omega' t_1} dt_1$$

is the spectrum of $\beta(t_1)$;

$$\beta(t_1) = \frac{i(t_1)}{J_0} + j\omega T_0 \frac{M_1 V(t_1)}{2U_0} + j\omega T_0 \frac{M_1 V_{11}(t_1)}{2U_0} + j\omega T_0 \frac{v(t_1)}{v_0}.$$ (6)

From (7) one can calculate the spectral density of the r.m.s. convection current. For the practical case, the author investigated it around frequency $N\omega_c$, where N - multiple of a harmonic, filtered on the output; deriving then

$$\frac{g_{i\phi}(\omega)}{I_0^2} = \left(1 + \frac{X^2}{9}\right) N^2 p^2 g_u +$$ (12)

Card 2/4

Combinational noise in transient ...

$$+ \frac{1}{1 + \left(2Q_1 \cdot \frac{\delta\omega}{\omega_0}\right)^2}\left[(q^2 g_V + s^2 g_N)\,\xi_1(NX) + 2Q_1 \frac{\delta\omega}{\omega_c}\,psg_N\xi_2(NX)\right]. \tag{12}$$

where

$$\xi_1(NX) = J_{N-1}^2(NX) + J_{N+1}^2(NX);$$

$$\xi_2(NX) = J_{N-1}^2(NX) - J_{N+1}^2(NX);$$

After analyzing (12), the author discusses 2 cases of practical interest. First, noise electron beam "near" $(10^4 - 10^5$ c/s) the carrier. For this he obtains

$$\frac{g_{i\phi}(\omega)}{J_0^2} \simeq \left[\left(1 + \frac{X^2}{2}\right)N^2(\Theta_1 - \Theta_0)^2 + \xi_1(NX)\left(\frac{M_1^2 \Theta_0 \Theta_1 R_1}{2R_0}\right)^2\right]\frac{(4-\pi)kT_R}{2R_0}. \tag{15}$$

where $\vartheta_0 = \omega_c T_0$, $\theta_1 = \omega_c T_1$. Second case: Noise bands at tens of megacycles from carrier. Then the author analyzes some numerical examples: a) Frequency multiplier klystron; b) Two-contour amplifying klystron; c) Cascade klystron operated in synchronized tuning. Finally, the following conclusions can be made: 1) More powerful klyCard 3/4

30434
S/109/61/006/012/009/020
D246/D305

Combinational noise in transient ...

strons give a better power signal-to noise ratio; 2) Low temperatu-
re cathodes are preferable; 3) In amplification, the narrow-band
noise is the main factor. In construction, one should aim at mini-
mum conventional noise current, exciting the input resonator; 4)
For the case of frequency multiplication with high tuning, a combi-
nation of θ_1 and θ_0 should be found which gives minimum noise.

There are a number of other types of noise, but not analyzed in the
paper, which should be taken into account when designing a tube.
There are 7 figures and 4 non-Soviet-bloc references. The referen-
ces to English-language publications read as follows: V.J. Norris,
The frequency-multiplier klystron, J. Electronics, 1956, 1, 5, 477;
M.O. Bryant, S.P. Lea-Wilson, Some experiments on broad-band c-w
klystron at x-band, J. Electronics and Control, 1959, 6, 6, 481;
F.M. H. Robinson, Microwave shot noise in electron beam and the mi-
nimum shot noise factor of TWT and klystrons, J. Brit. Instn. Radio
Engrs., 1954, 14, 2, 79.

SUBMITTED: March 24, 1961

Card 4/4

KORNILOV, S.A.

Combination noise in a transit klystron. Radiotekh. i elektron.
6 no.12:2017-2027 D '61. (MIRA 14:11)
(Klystrons--Noise)

9.4220

S/194/62/000/006/147/232
D201/D308

AUTHOR: Kornilov, S.A.

TITLE: Some results of experimental study of glass-metal
             klystron multipliers

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
             no. 6, 1962, abstract, 14, 6Zh97 (Sb. tr. XIII Lenin-
             gr. nauchn.-tekhn. konferentsii, posvyashch. dnyu ra-
             dio. L. 1959, 94-103)

TEXT: The results of development and of experimental analysis of
klystron multipliers are given. The multipliers had a multiplica-
tion factor of 10, output power of about 50 milliwatts and effi-
ciency of the order of tenths of one percent (the frequency of the
tenth harmonic about 3000 mc/s). Constructions of klystrons having
an input gap with and without a grid are discussed; some considera-
tions in favour of the latter type, as having better parameters,
are given. [Abstracter's note: Complete translation.]

Card 1/1

KORNILOV, S.A.

Low-frequency modulation noise in a transit klystron.
Radiotekh. i elektron. 8 no.11:1881-1891 N '63.
(MIRA 17:1)

AUTHOR: Karatetskiy, S. S.; Kornilov, S. A.; Khatskevich, Ye. I. Members of the
Society (see Association)

TITLE: Potentialities of the coherent method of measuring low-frequency fluctuations in low-power SHF oscillators 2F

TOPIC TAGS: SHF oscillator; measuring SHF fluctuations

ABSTRACT: In measuring low-frequency fluctuations by means of a crystal detector, the post-detector amplifier receives (a) measurand fluctuations and (b) crystal noise whose spectral density, at frequencies under 10 sup 4 or 10 sup 5 cps, is inversely proportional to the frequency. Effect of the crystal noise can be eliminated in a two-channel instrument that permits segregating the coherent from the incoherent noises. Such a system was used by Nikonov (Izvestiya vuzov MVSSO, seriya "Radiofizika", vol 2, no. 6, 1959) for measuring fluctuations in a reflex klystron within 40 mc down to hundreds kc. Potentialities of the two-channel method are analyzed mathematically in the article. Errors inherent to the method are considered, and the maximum sensitivity of the method is determined in terms of detector and measuring-circuit parameters. Orig. art. has: 10 formulas and 4 figures.
Card 1/2

L 10279-63
ACCESSION NR: AP3001130

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im.
A. S. Popova (Scientific and Technical Society of Radio Engineering and Electro-
communications)

SUBMITTED: 19Oct61   DATE ACQD: 01Jul63   ENCL: 00

SUB CODE: CO, SD   NO REF SOV: 002   OTHER: 003

Card 2/2

L 54559-65   EWT(1)/EWG(m)/EWA(h)   Peb

ACCESSION NR: AP5015250   UR/0286/65/000/009/0034/0034
                                                 621.314.26

AUTHOR: Kornilov, S. A.

TITLE: Electronic frequency converter. Class 21, No. 170551

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 34

TOPIC TAGS: frequency converter, reflex klystron

ABSTRACT: The proposed converter of electrical oscillations in the microwave range
utilizes a reflex klystron to improve reliability and reduce sensitivity to over-
loading. To achieve heterodyning and mixing of oscillations simultaneously, the
converted signal is fed to a resonance system and an i-f voltage is picked off from
the electrodes of the cavity reflector. Orig. art. has: 1 figure.   [DW]

ASSOCIATION: none

SUBMITTED: 21Sep61   ENCL: 00   SUB CODE: EC

NO REF SOV: 000   OTHER: 000   ATD PRESS: 4028

Card 1/1

L 3805-66   EWT(1)/EWA(h)   JM
ACCESSION NR: AP5017660

UR/0109/65/010/007/1244/1249
621.385.623.4

AUTHOR: Kornilov, S. A.

TITLE: Amplitude and phase fluctuations in a klystron due to general initial noise

SOURCE: Radiotekhnika i elektronika, v. 10, no. 7, 1965, 1244-1249

TOPIC TAGS: klystron

ABSTRACT: Formulas are developed for calculating the energy spectra of
amplitude and phase fluctuations at a klystron output which are due to r-f current
and velocity noise of the electron beam. Initial conditions are specified as energy
spectra of arbitrarily correlated fluctuations of current and velocity. In addition
to the shot noise, the current-distribution noise and input-resonator thermal noise
are also allowed for. The formulas hold true for large signal-bunching
parameters. The entire problem of calculating the output fluctuations is sub-
divided into these two steps: (1) The initial noise conditions are determined by

Card 1/2

L 3805-66
ACCESSION NR: AP5017660

calculating the conversion of cathode fluctuations in the gun accelerating field and in the input-anode drift space; also, the current-distribution noise is calculated; (2) Conversion of the beam r-f noise into output amplitude-and-phase fluctuations, with the klystron operating under nonlinear conditions, is calculated. The above method is suitable for multiplying and amplifying klystrons including the cascade types. Orig. art. has: 2 figures and 22 formulas.

ASSOCIATION: none

SUBMITTED: 22May64   ENCL: 00   SUB CODE: EC

NO REF SOV: 002   OTHER: 002

Card 2/2

L 21753-66   EWT(1)/EWA(h)   JW

ACC NR: AP6004893   SOURCE CODE: UR/0057/66/036/001/0163/0173

AUTHOR: Kornilov, S. A.

ORG: Leningrad Polytechnic Institute im. M.I.Kalinin (Leningradskiy politekhnicheskiy institut)

TITLE: On the spectral line width of a reflex klystron

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 1, 1966, 163-173

TOPIC TAGS: reflex klystron, line width, low frequency, spectral energy distribution, Fourier transform, line broadening, phase analysis

ABSTRACT: The effect of low frequency amplitude and phase fluctuations on the line width of a reflex klystron is calculated with secondary emission and current distribution fluctuations as well as flicker effect and low frequency beam noise taken into account. The amplitude and phase are averaged over a period of the high frequency oscillations, and the oscillation equations for the usual equivalent circuit for a reflex klystron are transformed as by V.N.Nikonov (Izv. vyssh. uch. zav., Radiofizika, 2, No. 6, 1959) and linearized. After a detailed discussion of the physical significance of the different terms the equations are solved with the aid of a Fourier transform and the spectral energy density is calculated. "Natural" and "technical" broadening are distinguished. Natural broadening is that due to those components of the frequency fluctuations, the spectrum of which is considerably broader than the value of the spectral density at zero frequency. Technical broadening arises from those

Card 1/2   UDC: 621.385.6

L-21753-66
ACC NR: AP6004893

components of the fluctuation whose spectral density increases significantly as the frequency approaches zero; its magnitude accordingly depends on the duration of observation. A numerical example is worked out for a klystron with a Q of 400, a cathode current of 20 mA, and a reflector potential of 300 V operating at 10^{10} Hz. In this case the natural broadening due to low and high frequency beam noise is 0.002 and 0.05 Hz, respectively, and the technical broadening associated with the flicker effect is $27 \times T^{0.1}$ Hz, where T is the observation time in seconds. The fact that the technical broadening depends only weakly on the observation time is due to the fact that the flicker noise is nearly inversely proportional to the frequency. Owing to the fluctuations of the electronic component of the resonator impedance, the flicker effect increases the line width for all values of the transit angle. The flicker effect influences the amplitude and frequency fluctuations not only directly, but also through the current distribution and secondary emission fluctuations. These effects may be considerable, for the space charge does not tend to damp the secondary emission fluctuations, but they are difficult to determine quantitatively. The secondary emission flicker is not correlated with the cathode current flicker, and it is suggested that the lack of correlation between cathode current fluctuations and frequency fluctuations reported for a reflex klystron by C.Mosher (JEEE Trans. ED-10, No. 2, 1963) may be associated with secondary emission flicker. The quality of the power supply can considerably affect the technical line broadening; the use of batteries is recommended. Orig. art. has: 39 formulas and 5 figures.

SUB CODE: 20/   SUBM DATE: 08Apr65/   ORIG REF: 011/   OTH REF: 004

Card 2/2 ULR

ACC NR: AP6023869   SOURCE CODE: UR/0109/66/011/007/1227/1237

AUTHOR: Kornilov, S. A.

ORG: none

TITLE: Amplitude and phase fluctuations in mixing klystrons

SOURCE: Radiotekhnika i elektronika, v. 11, no. 7, 1966, 1227-1237

TOPIC TAGS: klystron, mixing klystron, SHF amplifier

ABSTRACT: Low-frequency fluctuations are theoretically investigated in a multi-resonator klystron whose first resonator is tuned to the initial-signal frequency, and other resonators, to a sum or difference (output) frequency. The small-signal conditions prevail in the first stage; the last stage may be nonlinear. The h-f current at the output of the first (mixing) stage is analyzed; the energy spectra of current fluctuations with and without the heterodyne signal are shown. Formulas

Card 1/2   UDC: 621.391.822.3:621.396.622.4

ACC NR: AP6023869

are derived for the energy spectra of amplitude and phase fluctuations due to h-f noise in the beam. Also, formulas for the energy spectra of l-f noise in the beam are deduced; transmission of signal and heterodyne fluctuations is explored. A numerical example illustrates the use of the formulas. Reducing the flicker effect by judicious selection of the transit angle is discussed (A. V. Whale, "A klystron oscillator....," 5th Intern. Congress on Microwave Tubes, Paris, 1964). Orig. art. has: 6 figures and 33 formulas.

SUB CODE: 09 / SUBM DATE: 22Mar65 / ORIG REF: 004 / OTH REF: 003

Card 2/2

SUBJECT   USSR / PHYSICS   CARD 1 / 2   PA - 1653
AUTHOR   KORNILOV,S.G.
TITLE   The Polarization Method for the Measuring of the Velocities of
              Particles which have an Intrinsic Magnetic Moment.
PERIODICAL   Žurn.eksp.i teor.fis,31, fasc.3, 512-513 (1956)
              Issued: 12 / 1956

The scheme of a spectrometer for bundles of such particles is similar to the
experimental system for the determination of the magnetic moments of insulated
particles. In the path of the bundle there are, in the following order, a
polarizator, a device for rotating the polarization plane, an analyzer, and
finally a particle detector. The device for the rotation of spin can be ad-
justed for the action of particles of only a certain energy. The analyzer re-
moves the remainder of the particles. The recordings of the detector correspond
to the number of particles with a certain energy in the spectrum of the bundle.
For neutral atoms with a magnetic moment the spectrometer (here for reasons of
accuracy for particles with spin 1/2) can be constructed as follows: The atom
bundle is split up into two components by an inhomogeneous field of the STERN-
GERLACH type. The re-orientation device then turns the spin of the atoms with
given velocity. Hereupon the particles pass through another STERN-GERLACH
field, which is similar to the first, so that the two components of the bundle
become spatially separated.
The spectrometer for neutrons can contain ferromagnetic polarizers: the re-
orientation device consists of a system of conductors with a current which

24.6400

65722
SOV/139-59-2-21/30

AUTHOR: Kornilov, S.G.

TITLE: A Resonance Method for the Measurement of Particle
           Velocity in Beams

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959,
           Nr 2, pp 140-146 (USSR)

ABSTRACT: A new method is described for measuring the velocity of
           free particles based on resonance reorientation of spins
           in a periodic magnetic field. The method is applicable
           to neutral particles having an intrinsic magnetic
           moment. A polarized beam of particles enters a device
           which rotates the plane of polarization and then enters
           an analyzer which transmits only those particles whose
           plane of polarization has been rotated; the particles are
           recorded by a detector. If the reorientating device can
           be constructed so that it will rotate the plane of
           polarization only of particles having a given velocity,
           then only these particles will be recorded by the
           detector. In the case of molecules (groups of atoms or
           single atoms) having energies of the order of a few Kev,
           the beam may be polarized by a Stern-Gerlach magnetic
Card 1/4   field in which an incident beam is split into a number of

A Resonance Method for the Measurement of Particle Velocity in Beams

65722
SOV/139-59-2-21/30

paramagnetic gas. When the above principle is used for
neutrons, the slow neutrons are polarized by passing them
through a ferromagnetic (Ref 2). In the case of fast
neutrons, nuclear scattering may be employed (Ref 3).
An important part of the apparatus is the reorientating
device. It is based on the precession of spins in a
magnetic field perpendicular to the direction of
polarization. In practice, the reorientating device can
be in the form of a system of conductors carrying currents
which produce the magnetic field which is periodic along
the particle trajectory. Typical forms of such
conductors are shown in Fig 2 and 3, in which the beam is
assumed to be travelling in the horizontal direction.
Design calculations have been carried out for such systems
and conditions for resonance spin reorientation have been
found. It is not stated whether the apparatus has
actually been built. Acknowledgments are made to
Professor P.V.Golubkov, B.M.Zamorozkov, M.A.Kovner and
A.S.Shekhter for valuable advice. There are 3 figures
Card 3/4

KORNILOV, V.

KORNILOV, V.   "The Stalingrad tractor," (An essay) Slavyane, 1949, No. 5, p. 47-52

SO: U-5240, 17Dec53, No. 25, 1949).

KORNILOV, V.

Lights over Drisvyaty. Vokrug sveta no.9:2-5 S '53.   (MLRA 6:10)
(Drisvyaty region, Lithuania--Electrification)
(Electrification--Drisvyaty region, Lithuania)

KORNILOV, V.

Gliders depart from the auto-tow takeoff. Kryl.rod. 7 no.8:10-11
Ag '56.   (MLRA 9:12)

1. Komandir zvena TSentral'noy planernoy shkoly Dobrovol'nogo
Obshchestva sodeystviya armii, aviatsii i flotu.
       (Gliding and soaring)

KORNILOV, V. A. (Veterinary Surgeon, Borisov Raion Veterinary Hospital, Minsk Oblast'),
KOTEL'NIKOV, A. A. (Candidate of Veterinary Sciences), Belorussian NIVI),

"Mobile stand for the roentgen apparatus RU-760."

Veterinariya, Vol. 37, No. 9, p. 58, 1960.

KOTEL'NIKOV, A.A., kand.veterinarnykh nauk; KORNILOV, V.A., veterinarnyy
    vrach

Movable support for X-ray RU-760 apparatus. Veterinariia 37
no.9:58-59 S '60.
                                                    (MIRA 14:11)

1. Belorusskiy nauchno-issledovatel'skiy veterinarnyy institut
(for Kotel'nikov). 2. Borisovskaya rayvetlechebnitsa, Minskaya
oblast' (for Kornilov).
                    (X-rays--Apparatus and supplies)

KORNILOV, V. A.

System for jet intraosseous blood transfusion. Probl. gemat. i perel. krovi no.1:40-41 '62.

(MIRA 15:7)

1. Iz kliniki termicheskikh porazheniy (nach. - prof. T. Ya. Ar'yev) Voyenno-meditsinskoy ordena Lenina akademii imeni S. M. Kirova.

(BLOOD—TRANSFUSION)

KORNILOV, V.A.

Pressure regulator employing a relay. Gaz.prom.no.1:25 Ja '57.

(Pressure regulators)

(MLRA 10:1)

KORNILOV, V. A.

Experience in the automatization of the pipeline transportation of gas. Gas.prom. 5 no.11:35-36 N '60.
(MIRA 13:11)
(Gas, Natural--Pipelines)

DUBOVOY, L.V.; PONOMARENKO, A.G.; KORNILOV, V.A.

Plasma resonance of electrons in a magnetic field. Zhur.tekh.fiz.
32 no.7:792-797 Jl '62.
(MIRA 15:8)
(Plasma (Ionized gases)) (Electrons) (Magnetic fields)

KORNILOV, V.A.

Automatic control of the EV-Z electromagnetic valve. Gaz. prom. 8
no.11:29-30 '63. (MIRA 17:11)

KORNILOV, V.D.; TUPITSYNA, A.F., redaktor; BEKKER, O.G., tekhnicheskiy
redaktor.

[Mine hoist operator; textbook for technical training of workers]
Mashinist shakhtnogo pod"ema. Uchebnoe posobie dlia proizvodstvenno-
tekhnicheskogo obucheniia rabochikh. Moskva, Gos.nauchno-tekhn.izd-
vo lit-ry po chernoi i tsvetnoi metallurgii, 1954. 228 p.(MLRA 7:11)
          (Mine hoisting)

KORNILOV, Vasiliy Denisovich; KIRICHOK, Yuriy Grigor'yevich; KOZLOV, V.K.,
    otv. red.; D'YAKOVA, G.B., red. izd-va; LOMILINA, L.N., tekhn.
    red.

[Principles of the safe and highly productive operation of hoists
in ferrous and nonferrous metal mines] Osnovy bezopasnoi i vysoko-
proizvoditel'noi raboty pod"emnykh ustanovok na rudnikakh (chernoi
i tsvetnoi metallurgii). Moskva, Gos. nauchno-tekhn. izd-vo lit-ry
po gornomu delu. 1961. 162 p.   (MIRA 14:10)
            (Mine hoisting)

GUDKOV, S.F.; IVANOV, A.K.; KORNILOV, V.F.; LUR'YE, B.I.; NALBANDYAN, A.B.; RUDENKO, P.S.

Plant test of the direct production of formaldehyde from natural gas. Gaz. prom. 8 no.4:35-39 '63.

(MIRA 17:10)

IVANOVA, N.A.; KORNILOV, V.G.

Adjustment of spider mites to mercaptophos in a cotton field. Trudy
VIZR no.20 pt.1:12-17 '64.   (MIRA 18:10)

KORNILOV, Vladimir Grigor'yevich; BERLIN, S.G., red.; POPOV, N.D.,
      tekhn. red.

      [Virgin soil of Galich]Galichskaia nov'. Moskva, Sovetskaia
      Rossiia, 1962. 71 p.   (MIRA 16:2)

      1. Sekretar' Galichskogo rayonnogo komiteta partii i agronom
      kolkhoza "XII Oktyabr'," Kostromskaya oblast' (for Kornilov).
          (Kostroma Province—Collective farms)

KORNILOV, V.I. (Gorno-Altaysk)

On Lake Teletskoye. Zdorov'e 5 no.10:25 O '59.   (MIRA 13:2)
(TELETSKOYE, LAKE)

SOV/137-58-7-15003

AUTHORS: Petrov, G.L., Kornilov, V.I.

TITLE: Welding of Nickel and Monel Metal (Svarka nikelya i monel'-metalla)

ABSTRACT: The possibility of obtaining high-quality arc-welded joints between Ni and Monel metal was investigated, together with the possibility of welding of Ni to austenite steel 1Kh18N9T. Welding electrodes made of Ni nickel and NMts 2.5 Ni-Mn alloy were employed in welding of both Ni and Monel metal. The electrodes were covered with a UONII-13/45 coating and a 44/44/12 coating manufactured by Krupp. Welding of Ni to 1Kh18N9T steel was accomplished with the aid of electrodes which produced welded joints composed of metal of any of the following types: Kh30, Kh22N15, Kh20N10G6, Kh20N12GZM2F, and Ni. Ni-Mn welding rods submerged in fluxes AN-20 and BKFT were employed in the investigation of the process of automatic welding of Ni. Current, welding rate, the method of advancing the arc, and the temperature of preliminary heating - all these

Card 1/2

SOV/137-58-7-15003

Welding of Nickel and Monel Metal

factors were varied in the course of the investigation. The materials investigation. The materials investigated were 4-5 mm thick. It was established that satisfactory joints may be obtained with rolled Ni stock of medium thickness if UONII-13/45 electrodes with NMts-2.5 cores are employed (σ_b =42-49 kg/mm^2; ϕ = 160-180°C). The porosity of welded Ni joints constitutes their major drawback. This condition may be remedied by employing moderate currents and rates of welding as well as procedures which tend to reduce the rate of cooling in the welding pool (longitudinal vibrations of the electrode etc.). Welded joints with mechanical properties identical to those produced by manual welding can be attained by automatic welding methods. Welding of Ni to steel 1Kh18N9T is readily accomplished by means of electrodes that produce welded joints composed of Cr-Ni austenite steel (electrodes: KTI-5; type of metal in the weld: Kh20N12GZM2F; σ_b = 46-48 kg/mm^2; rupture occurs in the vicinity of the weld). Monel sheet metal lends itself readily to manual arc welding with electrodes of the UONII-13/45 type with cores the composition of which is identical to the parent metal. The welded seams do not exhibit any macroporousness and possess the following mechanical properties: σ_b =48-53 kg/mm^2, ϕ = 160-180°.   1. Nickel--Welding 2. Nickel alloys--Welding 3. Arc welding--Electrodes
Card 2/2   4. Welding fluxes--Applications   V.S.

KORNILOV, V.N.

On the narrow-gauge railroad of a peat enterprise. Put' i
put. khoz. 8 no.1:22 '64.
(MIRA 17:2)

1. Glavnyy inzh. Kupanskogo transportnogo upravleniya.

KORNILOV, V.V., inzh.; KURPE, V.I., inzh.

Improving the design of soaking pits in blooming mills. Met. i gorno-
rud. prom. no.3:69-71 My-Je   63.   (MIRA 17:1)

1. Zavod "Azovstal'".

ACCESSION NR: AP4019005   S/0146/64/007/001/0152/0156

AUTHOR: Makarov, B. I.; Kornilov, V. V.

TITLE: Simple method for determining actual natural frequency and damping of vibrators of an electromechanical oscillograph

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 1, 1964, 152-156

TOPIC TAGS: oscillograph, electromagnetic oscillograph, vibrator type oscillograph, oscillograph vibrator frequency, oscillograph vibrator damping, MOV-2 oscillograph

ABSTRACT: On the nameplates of electromagnetic-oscillograph vibrators, their natural frequency of oscillations in air is indicated. The actual natural frequency — much lower than on the nameplate — can be determined from the response of a vibrator to the application of a unit step input. An oscillogram of that response shows the natural frequency and damping involved. Five vibrators of a Soviet-made MOV-2 oscillograph were investigated with these results:

Card 1/2

ACCESSION NR: AP4019095

Vibrator	Natural Frequency in Air, cps.	Actual Natural Frequency, cps.	Damping
VIII	1200	350—365	0,87—0,92
V	2000	1230—1240	0,71—0,73
IV	3000	730—830	0,80—0,82
II	10000	4900—5900	0,95—1,00
I	5000	1700—2300	0,69—0,95

Orig. art. has: 4 figures, 2 formulas, and 1 table.

ASSOCIATION: Ry*binskiy vecherniy tekhnologicheskiy institut (Ry*binsk Evening Technological Institute)

SUBMITTED: 01Jun63   DATE ACQ: 23Mar64   ENCL: 00

SUB CODE: EE   NO REF SOV: 001   OTHER: 000

Card 2/2

MAKAROV, B.I.; KORNILOV, V.V.

Simple determination of effective frequency values
and of the damping rate of oscillators of an electromechanical
oscillograph. Izv. vys. ucheb. zav.; prib. 7 no.1:152-
156 '64.   (MIRA 17:9)

1. Rybinskiy vecherniy tekhnologicheskiy institut. Rekomendovana
kafedroy soprotivleniya materialov i detaley mashin.

KORNILOV, V.V.; MAKAROV, B.I.

Measurement of quick-changing temperatures in conducting solids with thermocouples. Izm. tekh. no.10:35-37 O '63. (MIRA 16:12)

KORNILOV, V.V., starshiy prepodavatel'

Theoretical and experimental determination of friction-surface temperature of a friction clutch during repeated momentary operations. Izv.vys.ucheb.zav.; mashinostr. no.5:36-41 '58.
(MIRA 12:5)

1. Moskovskiy stankoinstrumental'nyy institut imeni Stalina.
(Clutches (Machinery)--Testing)

KORNILOV, V. V., Cand Tech Sci -- (diss) "Research into the thermal conditions of disk friction clutches." Moscow, 1960. 19 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Machine Tool Instrument Inst im I. V. Stalin); 150 copies; price not given; (KL, 22-60, 137)

KHARCHENKO, I.F.; FAYNBERG, Ya.B.; NIKOLAYEV, R.M.; KORNILOV, Ye.A.;
    LUTSENKO, Ye.A.; PEDENKO, N.S.

    Investigating the interaction between an electron beam and
    plasma. Zhur.eksp.i teor.fiz. 38 no.3:685-692 Mr '60.
                                            (MIRA 13:7)

    1. Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy
    SSR.
        (Electron beams) (Plasma (Ionized gases))

9,3130 (1163,1538,1141)

24.6716

25021
S/057/61/031/007/001/021
B108/B209

AUTHORS: Kharchenko, I. F., Faynberg, Ya. B., Nikolayev, R. M.,
Kornilov, Ye. A., Lutsenko, Ye. I., and Pedenko, N. S.

TITLE: Interaction of an electron beam with a plasma in a magnetic
field

TEXT: The interaction between a beam of charged particles and a plasma
has great physical and technical significance and is therefore subject to
the present study. In a plasma in a magnetic field, an electron beam may
interact with both E and H waves. Moreover, parameter resonance may occur
since the arising waves lead to a change of the parameters which is
periodical in space and time. When the frequency of the plasma particles
stands in a certain ratio to the frequency of the electromagnetic field
forming by self-modulation of the electron beam when moving through a
plasma, parameter resonance is possible. This ratio between the frequency
ω of the longitudinal waves, due to the interaction between beam and

Card 1/3

Interaction of an electron beam ...

25021
S/057/61/031/007/001/021
B108/B209

in the beam (1800 to 3000 Mc/sec, half-width 30 - 50 Mc/sec) offer the possibility of obtaining millimeter waves by further increasing the magnetic field strength. Further results are announced to be given in a following paper. This paper was read at the Second Conference on Magnetohydrodynamics, Riga, July 1960. There are 3 figures, and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Institute of Physics and Technology AS UkrSSR Khar'kov)

SUBMITTED: October 3, 1960

Card 3/3

L 44714-66   EWT(1)   IJP(c)   AT

ACC NR: AP6031588   SOURCE CODE: UR/0386/66/004/004/0147/0152

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Kovpik, O. F.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Spatial and temporal correlations of electric fields in a weakly turbulent plasma

TOPIC TAGS: turbulent plasma, plasma diagnostics, electric field, autocorrelation function, spectral energy distribution, plasma beam interaction, plasma instability

ABSTRACT: The purpose of the present work was to determine the spectral energy density E_k^2 of the electric field during the transition of a plasma into a turbulent state, using as an example the simplest and most prevalent two-stream instability. This was done by measuring the spatial autocorrelation functions of the electric fields of high-frequency oscillations excited in a plasma-beam discharge. The experiment was carried out with an electron beam with energy up to 5 kev and current 20-100 ma, in a magnetic field up to 2000 G and at 10^{-4} mm Hg pressure (Fig. 1). Under these conditions, a plasma was produced with density up to 6×10^{11} el/cm^2. With the aid of a cylindrical cavity placed ahead of the interaction chamber, the beam could be modulated at a frequency of 3,000 MHz. The spatial autocorrelation function $R(l)$ was

Card   1/2

L 44714-66

ACC NR: AP6031588

H

determined by summing oscillations (600-6000 MHz) received at different points of the discharge in a quadratic detector, with subsequent time averaging. From the form of the autocorrelation function it was possible to estimate the correlation length and the spectral energy density of the electric field. Plots are presented of the spatial autocorrelation functions of the oscillations and spectral energy density of the electric field and of the temporal autocorrelation functions of the oscillations. It is deduced from an analysis of the results

Fig. 1. Measurement scheme

that the oscillations of a plasma-beam discharge have an irregular stochastic character, with the correlation length and the correlation time depending essentially on the oscillation amplitude. A decrease in the oscillation amplitude, as well as external modulation, leads to an increase in the length and time of the correlation and to a transition from irregular to regular oscillations. The authors thank V. D. Shapiro and V. I, Kurilko for a discussion of the results, A. G. Shevlyakov for help with the measurements, and L. I. Bolotin for interest and help with the work. Orig. art. has: 3 figures and 3 formulas.
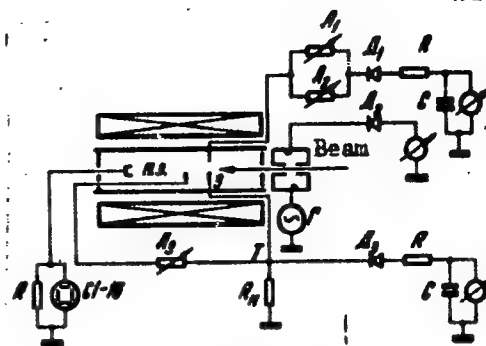
SUB CODE: 20/   SUBM DATE: 11Jun66/   ORIG REF: 008/   OTH REF: 001

Card 2/2

L 2488-66   EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2   IJP(c)   AT
ACCESSION NR: AP5020720   UR/0057/65/035/008/1372/1377

AUTHOR: Kornilov, Ye. A.; Kovpik, O.F.; Faynberg, Ya. B.; Karchenko, I.F.

TITLE: Mechanism of plasma formation during development of beam instability

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1372-1377

TOPIC TAGS: plasma instability, plasma heating, plasma beam interaction, plasma
oscillation, electron beam, magnetic field, air, hydrogen, argon

ABSTRACT: The authors have investigated the production of plasma by a 3-5 mm dia-
meter 10-50 mA beam of 2-5 keV electrons traversing the 40 cm length of a 10 cm
diameter glass tube containing air, argon, or hydrogen at different pressures in
the presence of a 0-2 kOe longitudinal magnetic field. The plasma density was
determined with Langmuir probes, with a 10 kMc/sec interferometer, and by the
detuning of a 3 kMc/sec resonant cavity. Oscillations excited in the plasma were
received with a dipole antenna outside the chamber and were investigated with a
spectral analyzer and with resonance wavemeters. At pressures below a critical
value the plasma density was close to the beam density and oscillations near the
Larmor frequency were observed. When the pressure was increased through the criti-

Card 1/2

L 2488-66
ACCESSION NR: AP5020720

cal value the plasma density increased by two or three orders of magnitude (ionizations of 10% were achieved in argon) and oscillations were observed near the Langmuir frequency, which at the plasma densities reached was higher than the Larmor frequency. The plasma density pulsated over a range of 50% at a frequency between 10 and 100 kc/sec. In the region of instability (which is ascribed to the Cerenkov effect), the electron beam lost nearly all its energy to the plasma. The authors believe that their results together with those of L.D.Smullin and W.D. Gotty (Phys. Rev. Letters, 9, 1, 3; 1962; J. Appl. Phys., 34, No. 12, 1963) indicate that with a beam of higher power there can be obtained highly ionized hot plasmas, heated by the kinetic energy of the beam. Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 26Oct64   ENCL: 00   SUB CODE: ME

NR REF SOV: 004   OTHER: 008

Card 2/2

L 2489-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5020721   UR/0057/65/035/008/1378/1384

AUTHOR: Kornilov, Ye. A.; Kovpik, O. F.; Faynberg, Ya. B.; Bolotin, L. I.;
Kharchenko, I. F.

TITLE: Time variations of high frequency oscillations during development of
instability in a beam-plasma system

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1378-1384

TOPIC TAGS: plasma instability, plasma beam interaction, plasma oscillation,
electron beam, magnetic field

ABSTRACT: The authors have continued their investigations, described in the pre-
ceding paper (ZhTF, 35, 1372, 1965; see abstract AP 5020720), of the production of
plasma by an electron beam traversing a gas in a longitudinal magnetic field. The
authors describe their apparatus in the preceding paper and in more detail else-
where (Fizika plasmy i problemy upravlyoyemogo termoyadernogo sinteza, Vol.4. Izd.
AN USSR, Kiyev, 1964). It was found that oscillations are excited at integral mul-
tiples of half the Larmor frequency and that the width and peak frequency of the
spectrum of these oscillations vary periodically at the frequency of ionic sound.

Card 1/2

L 2489-66
ACCESSION NR: AP5020721

The spectrum narrows with increasing pressure and broadens with increasing beam
current. When the magnetic field strength is increased beyond a certain value, the
oscillations cease to be continuous but come in bursts which follow each other at
intervals that decrease with increasing magnetic field strength. Tilting the beam
moderately with respect to the direction of the magnetic field so as to introduce
a small transverse velocity component increased the amplitude of the oscillations
by two orders of magnitude. The reasons for the pulsation of the oscillations at
high field strengths, for the increase of the amplitude of the oscillations in the
presence of a transverse electron velocity component, and for the periodic varia-
tion of the spectrum of the oscillations are still obscure. Orig. art. has: 7 fi-
gures.

ASSOCIATION: none

SUBMITTED: 26Oct64   ENCL: 00   SUB CODE: ME

NR REF SOV: 012   OTHER: 007

Card 2/2

L 06312-67   AT(1)   IJP(c)   AT/GD

ACC NR: AT6020432   SOURCE CODE: UR/0000/65/000/000/0024/0035

AUTHOR: Kornilov, Ye. A.; Kovpik, O. F.; Faynberg, Ya. B.; Khrachenko, I. F.

72
β+1

ORG: none

TITLE: Investigation of particle energy and conditions of excitation of low frequency
oscillations in a plasma formed by the growth of instabilities in a beam-plasma system

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Inter-
action of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 24-35

TOPIC TAGS: ion current, ion density, plasma interaction, plasma beam interaction,
acoustic frequency

ABSTRACT: The conditions necessary for the excitation of ion currents in experiments
where electron beams traverse the plasma are reported. The experiment is described and
a diagram of it is given. An electron beam of 2-5 kev electrons (10-80 mA) is incident
on the plasma in the magnetic field (0-2 kg) parallel to the beam. Movable analyzers
were used thus permitting the interaction length of beam and plasma to be changed. Ana-
lysis of the discharge showed that ion current density across the magnetic field lines
is smaller than that along the field lines. These currents could be generated only
when the ambient pressure was between $4 \cdot 10^{-4}$ and 10^{-2} mm Hg. The current maximum also
appears at a pressure corresponding to maximum plasma oscillations. It is also shown

Card 1/2

L 06312-67

ACC NR: AT6020432

that the electron ion currents emerging from the plasma are equal to the current en-
tering the plasma. The observation of outflowing currents has shown that for suffi-
ciently long plasma-beam interaction length, the current from the end of the plasma
consisted solely of ions. The investigation of the frequency distribution of the ex-
cited oscillations shows that the ion current arises in situations favoring the produc-
tion of instabilities. The most favorable conditions for generating beams of ions
with energies up to 1 kev are given. The study of excitation frequency change with
electron temperature and type of gas used shows that the low frequency oscillations
generated in the experiment were near the ion-acoustic frequencies. Further study of
the generation of low frequencies is needed. Orig. art. has: 6 figures, 1 table.

SUB CODE: 20/   SUBM DATE: 11Nov65/   ORIG REF: 017/   OTH REF: 003

Card 2/2

L 06311-67   AT(1)   IJP(c)   AT/GD

L 06311-67   SOURCE CODE: UR/0000/65/000/000/0036/0043

ples of electron cyclotron frequencies. The spectrum near the maxima changes periodi-
cally during the discharge; the time period of the change is very close to that of the
ion-acoustic wave. It is shown that relative width of the spectrum narrows as the
pressure increases and broadens with increase of the beam current. At magnetic field
intensities higher than critical, the plasma-beam discharge was found to change to a
relaxation type of wave excitation. During the excitation periods, the beam current
was strongly damped indicating very strong interaction with the plasma. Orig. art.
has: 5 figures.

SUB CODE: 20/   SUBM DATE: 11Nov65/   ORIG REF: 012/   OTH REF: 007

Card 2/2

KARPOV, Mikhail Mikhaylovich; POTEMKIN, A.V., dots., otv. red.;
    KORNILOV, Ye.A., red.; PAVLICHENKO, M.I., tekhn. red.

[Basic principles governing the development of the natural
sciences] Osnovnye zakonomernosti razvitiia estestvoznaniia.
Rostov-na-Donu, Izd-vo Rostovskogo univ., 1963. 300 p.
                                    (MIRA 17:3)

L 24119-66   EWT(1)
ACC NR: AP6014609   SOURCE CODE: UR/0386/66/003/009/0354/0357

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Bolotin, L. I.; Kovpik, O. F.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Suppression of low-frequency oscillations in two-stream instability by prior modulation of the electron beam

TOPIC TAGS: plasma instability, plasma oscillation, plasma beam interaction, electron beam, beam modulation

ABSTRACT: This is a continuation of earlier work (coll. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy [Interaction of Charged Particle Beams with a Plasma], p. 18, Kiev, 1965), where it was shown that development of a two-stream instability is accompanied, besides high-frequency oscillations (1000--6000 Mcs), also by low-frequency oscillations (10 kcs--30 Mcs) and by intense ion currents. To check on the cause of these low-frequency oscillations and to find methods of suppressing these oscillations, the authors experimented with an electron beam (up

Card 1/2

L 24119-66
ACC NR: AP6014609

to 100 ma) of 2--5 kev particles injected into an interaction chamber situated in
a longitudinal magnetic field of intensity up to 2000 oe. The experimental setup
was similar to that described earlier. The results show that the low-frequency
oscillations are caused by the high-frequency ones and can be suppressed by modu-
lating the beam at a modulating frequency equal to twice the electron gyro frequen-
cy. The prior modulation of the beam suppresses also the high-frequency oscilla-
tions. The suppression efficacy increases with increasing depth of modulation.
Orig. art. has: 2 figures.

SUB CODE: 20/   SUBM DATE: 28Feb66/   ORIG REF: 005

Card 2/2

BRONSKIY, N.I., dots.; REZNIKOV, A.P., dots.; YAKOVLEV, V.P.,
aspirant; ZHDANOV, Yu.A., prof., red.; KORNILOV, Ye.A.,
red.; PAVLICHENKO, M.I., tekhn. red.

[V.I.Vernadskii; on the 100th anniversary of his birth]
V.I.Vernadskii; k stoletiiu so dnia rozhdeniia. Rostov-na-
Donu, Izd-vo Rostovskogo univ., 1963. 102 p.
(MIRA 16:12)

1. Rostovskiy gosudarstvennyy universitet (for Bronskiy,
Reznikov).
(Vernadskii, Vladimir Ivanovich, 1863-1945)

SOLOV'YEV, Aleksandr Ivanovich; KOSENKO, I.A., dots., otv. red.;
KORNILOV, Ye.A., red.

[Theory of simple computing and measuring mechanisms]
Teoriia prosteishikh schetno-reshaiushchikh i izmeritel'-
nykh mekhanismov. Rostov-na-Donu, Izd-vo Rostovskogo
univ., 1964. 61 p.   (MIRA 18:6)

L 8564-65   EWT(1)/EWG(k)/EWA(m)-2/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2
Pz-6/Po-4/Pab-24/Pi-4   IJP(c) AFETR/AFWL/SSD/ASD(f)/ASD(a)-5/REAM(a)/
ASD(p)-3/ASD(d)/AEDC(b)/ESD(gs)/ESD(t)   AT   S/0057/64/034/006/1031/1036
ACCESSION NR: AP4040306

AUTHOR: Kharchenko,I.F.; Faynberg,Ya.B.; Kornilov,Ye.A.; Pedenko,N.S.

TITLE: Excitation of oscillations in a plasma by an electron beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 1031-1036

TOPIC TAGS: plasma, plasma density, plasma oscillation generation, plasma magnetic
field interaction, electron beam

ABSTRACT: The excitation of oscillations in a plasma in a longitudinal magnetic
field by an unmodulated electron beam was investigated experimentally. A 30 cm long
beam of 2 to 5 keV electrons was employed with magnetic fields up to 2000 Oe. The
plasma was formed by ionization of the residual gas, usually at a pressure of seve-
ral microns of mercury, first by the electron beam, and subsequently by oscillating
plasma electrons. Oscillations of the plasma were observed by examining the signal
induced in a dipole antenna located near the apparatus, and by measuring the high
frequency component of the electron beam current leaving the system. Intense oscil-
lations were observed at frequencies close to 1.4, 1.65, 2,or 3 times the electron
Larmor frequency when the electron beam energy and the magnetic field strength sat-

Card 1/3

L 8964-65

ACCESSION NR: AP4040306

isfied certain conditions. When these oscillations were excited the plasma density reached a value between 5×10^{10} and 2×10^{11} cm^{-3}, the oscillation frequency was accordingly approximately equal to the electron Langmuir frequency, and the dispersion was anomalous. The intensity of these oscillations was greatest where the electron beam entered the plasma, and the signal decreased, with a double spatial periodicity, as the dipole antenna was moved along the tube in the direction of the beam. When conditions as regards the beam energy and magnetic field for excitation of these oscillations were not satisfied, oscillations at the Larmor frequency were observed. Low-frequency oscillations (several hundred Mc/sec) were also detected. The oscillations are discussed in terms of the dispersion equation derived by M.F.Gorbatenko (ZhTF 33,173,1963) for the interaction of an electron beam with a plasma. A linear theory, however, cannot account for the discrete regions of magnetic field strength (for fixed electron beam energy) required for excitation of the oscillations, and it is suggested that a non-linear coupling between electron cyclotron oscillations and plasma oscillations is involved. Orig.art.has: 5 formulas and 4 figures.

Card 2/3

L 8584-65

ACCESSION NR: AP4040306

ASSOCIATION: none

SUBMITTED: 04Jul63

SUB CODE: ME, NP

ATD PRESS: 3095

NO REF SOV: 009

ENCL: 00

OTHER: 004

Card 3/3

POTAPOV, Igor', Ivanovich; YEGOROV, A.I., prof., otv. red.;
KORNILOV, Ye.A., red.

[Geotectonics; a textbook] Geotekhnika; uchebnoe posobie.
Rostov-na-Donu, Izd-vo Rostovskogo univ., 1964.   251 p.
(MIRA 18:7)

KORNILOV, Yu.

In the land of people scorched by the sun. Sov. profsoiuzy 19
no.13:40-42 Jl '63.   (MIRA 16:9)
(Ethiopia--Social conditions)

ACC NR: AN7003356   SOURCE CODE: UR/9018/67/000/016/0004/0004

AUTHOR: Kornilov, Yu. (Correspondent of TASS; Split-Belgrade)

ORG: none

TITLE: 4000 miles on hydrofoil [Sea-going hydrofoil ship]

SOURCE: Sovetskaya Kirgiziya, no. 16, 19 Jan 67, p. 4, col. 8

TOPIC TAGS: hydrofoil, ship, cargo ship

ABSTRACT:
A new sea-going version of the Soviet hydrofoil "Kometa" has arrived in the
Yugoslav Adriatic port of Split. It has a top speed of 34 miles per hour
and can carry more than 100 passengers. Its captain, V. Bogachev, said
that Soviet hydrofoils are very much in demand all over the world, and that
recently they have been purchased by such countries as the USA and the FRG.
The Soviet export firm "Sudoimport" wishes to continue their trading but the
customers must become more familiar with their vessels; therefore, this is the reason
for the long ocean voyage. The Soviet vessel left Yalta and crossed the
Black Sea, the sea of Marmara, and the Aegean, Ionic, and Adriatic seas to
reach Yugoslavia.

SUB CODE: 13/ SUBM DATE: none/ ATD PRESS: 5113

Card 1/1   UDC: none

KORNILOV, Yu.
New features of China. Okhr.truda i sots.strakh. 3 no.3:75-77
Mr '60.   (MIRA 13:7)
     (CHINA--TUBERCULOSIS--HOSPITALS AND SANATORIUMS)

PUSHKAREV, V., kand. tekhn. nauk; KORNILOV, Yu., inzh.

Problems in the execution of overall engineering preparations in the area of a microdistrict. Zhil. stroi. no.5:6-9 '65.   (MIRA 18:7)

KORNILOV, Yu.

Under the banner of unity. Sov. profsoiuzy 17 no.8:14-16 Ap '61.
(MIRA 14:3)

(Labor and laboring classes)
(World politics)
(Trade unions)

KORNILOV, Yu. (Gavana)

A genuine "Corona." Sov. profsoiuzy 17 no.21:45-47 N '61.
(Cuba—Tobacco industry)

KORNILOV, Yu.

In various continents. Sov.profsoiuzy 18 no.22:31-33 N '62.
(MIRA 15:12)

(Trade unions)   (World politics)

USSR / Farm Animals. Cattle.   Q

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 7364

Author   : Kornilov, Yu. D.; Litvyankov, A. S.
Inst   : Vitebsk Zooveterinary Institute
Title   : A Cheap Method of Increasing the Milk's Fat
             Content in Cows

Orig Pub : Sel'ska gaspadarka Belarusi, 1957, No 10,
             39-40

Abstract : An experiment was conducted at the Podberez'-
             ye training farm of the Vitebsk Zooveterinary
             Institute in which the milk's fat content was
             raised in cows by feeding them brewer's yeast
             according to the method which was proposed by
             Professor M. Gulyy and the Academician Pshe-
             nichnyy. As a result of the cows being fed

Card 1/2

51

KORNILOV, I.D., kand.ekon.nauk, dots.; Cheredkov, S.N., kand.vet.nauk;
YAKIMCHIK, V.F., zootekhnik

Reducing the cost of artificial insemination of cows. Zhivot-
novodstvo 21 no.6:23-25 Je '59.   (MIRA 12:8)

1. Vitebskiy veterinarnyy institut (for Kornilov). 2. Zaveduyu-
shchiy Vitebskoy gosudarstvennoy mezhrayonnoy stantsiyey iskusstven-
nogo osemeneniya zhivotnykh (for Cheredkov).
                (White Russia--Artificial insemination)

BATURIN, Andrey Alekseyevich; KORNILOV, Yuriy Emannuilovich; LARICHEV,
V.I., red.; RAKOV, S.I., tekhn.red.

[Facts against lies; a pamphlet] Fakty protiv lzhi; pamflet.
Moskva, Izd-vo VTsSPS Profizdat, 1959. 69 p.   (MIRA 12:12)
(Russia--Economic conditions)

KORNILOV, Yuriy Emmanuilovich; ALEKSEYEV, F., red.; DANILINA, A., tekhn. red.

[Meany and Reuter, servants of monopolies] Mini i Reiter-prisluzhniki monopolii. Moskva, Gos.izd-vo polit.lit-ry, 1960. 71 p. (MIRA 14:5)
(United States--Trade unions)

KORNILOV, YU.G.

Ionic Temperature Regulators. U. G. Kornilov. *(Technuja Industria (Petroleum Ind.), 1940, (2), 9–12)   [In Russian.]   A brief description.*

ASM SLA   METALLURGICAL LITERATURE CLASSIFICATION

KORNILOV, IU. G. and V. D. PIVEN

Osnovy teorii avtomaticheskogo regulirovaniia v prilozhenii k teplosilovym
ustanovkam. Leningrad, Mashgiz, 1947. 307 p. diagrs.

Bibliography: p. 305-/306/.

Fundamentals of the theory of automatic control applied to steam power plants.

DLC: TJ254.K64

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library
of Congress, 1953.

KORNILOV, G.

Apr 1947

USSR/Turbines, Steam
     Controllers

"Electromechanical Boiler Controllers of the Central
Boiler and Turbine Institute," G. Kornilov, 5 pp

"Kotloturbostroyeniye" No 2

Describes the construction of the controllers
and discusses their operating principles, with a
brief account of their adjustment. Illustrated
with schematic diagrams and a photograph of a
controller.

12T50

PA 187T32

KORNILOV, YU. G.

USSR/Mathematics - Servomechanisms   Jan/Feb 51

"Conditions Governing the Automaticity of Continuous and Discontinuous Regulation Systems of Definite Classes," Yu. G. Kornilov, Cen Boiler-Turbine Inst imeni I. I. Polzunov

"Avtomat i Telemekh" Vol XII, No 1, pp 7-14

Following the ideas of I. N. Voznesenskiy on automatic regulation, Kornilov considers conditions governing its realization in the case where continuous-action regulators with constant-speed servomotors and discontinuous-action regulators with forced rhythm or circuit interruption are

187T32

USSR/Mathematics - Servomechanisms   Jan/Feb 51
(Contd)

employed, which situation is characteristic of most elec systems. Shows such regulation is not possible to obtain, except where there is slippage and certain "transposition." Submitted 23 Mar 49.

187T32

KORNILOV, Yu. G.   Cand. Tech. Sci.

    "Problem of Dispatching Gas to Administrations of Large Cities," a paper
presented at the All-Union Conference on Telemetering and the National Economy,
29 Nov to 4 Dec 1954, M$_o$scow.

Inst. of Gas Utilization, AS UkrSSR

M-1029, 28 Mar 56